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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,589	08/22/2005	David W. Mazyck	A8713	5632

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EXAMINER	
SAVAGE, MATTHEW O	

ART UNIT	PAPER NUMBER
1797	

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03/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,589	MAZYCK ET AL.	
	Examiner	Art Unit	
	Matthew O. Savage	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-24* is/are pending in the application.

4a) Of the above claim(s) *15-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4, and 6-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brym in view of Zhang et al.

With respect to claim 1, Brym discloses a method for removing mercury from a fluid stream (see line 66 of col. 6, the fluid being water as mentioned in the abstract) including the steps of: providing a composite material comprising a substrate (e.g., plates of glass or ceramic, see lines 48-49 of col. 8) and catalyst particles (e.g., TiO_2, see lines 50-51 of col. 8); and contacting a fluid stream with the composite, wherein the composite adsorbs and oxidizes the mercury (e.g., to MgO, see line 66 of col. 6, the TiO_2 being capable of absorbing and oxidizing the mercury). Brym fails to specify the catalyst particles as being dispersed in the substrate. Zhang et al discloses a composite material that includes catalyst particles disposed within the substrate (e.g., silica gel treated by the process described on lines 32-51 of col. 10) and suggests that such a support provides a large surface area for adsorption and oxidation of oxidizing contaminants. It would have been obvious to have modified the method of Brym so as to have included the substrate in the form of a sorbent as suggested by Zhang et al in

order to increase the amount of surface area for the adsorption and oxidation of contaminants including organic contaminants and mercury.

With respect to claim 3, Brym and Zhang et al disclose TiO_2 which can function as a sorbent. In addition, Zhang et al disclose silica gel which can function as a sorbent.

Concerning claim 4, Zhang et al disclose a gel (e.g., silica gel, see line 12 of col. 9).

Concerning claim 6, Brym and Zhang et al disclose the step of irradiating the composite material with radiation (e.g., with ultraviolet light, see lines 33-38 of col. 9 of Brym, and from line 45 of col. 5 to line 9 of col. 6 of Zhang et al).

As to claim 7, Brym discloses the radiation as having a wavelength of from about 160 to about 680 nm (e.g., 320-400 nm, see lines 36-38 of col. 9).

Concerning claim 8, Zhang et al disclose a silica gel substrate that is transparent to radiation (see lines 12-14 of col. 9).

Concerning claim 9, Zhang et al specify a substrate formed of porous silica (e.g., Davissil^{TM}).

Regarding claim 10, Brym and Zhang et al disclose a catalyst comprising TiO^2 (see line 23 of col. 8 of Brym and line 50 of col. 10 of Zhang et al).

As to claim 11, Zhang et al discloses a support formed of silica gel, specifically Davisil^{TM} which has a surface area of 1-1500 m^2g.

Regarding claim 12, Brym fails to specify the catalyst as being present in an amount from .1-100%. Zhang et al teach using catalyst present in a composite material in an amount of .1-50% and teaches that such an arrangement increases the surface

area of a catalyst bed when using the catalyst in particulate form. It would have been obvious to have modified the method of Brym so as to have included the arrangement of Zhang et al in order to increase the surface area of the catalyst bed.

Concerning claim 13, Brym fails to specify regenerating the composite. Zhang et al disclose regenerating an analogous composite (see lines 5-7 of col. 12) and suggests that such a step removes accumulated contaminants from the composite thereby maintaining the contaminate removal efficiency at a high level. It would have been obvious to have modified the method of Brym so as to have included the regeneration step as suggested by Zhang et al in order to maintain the contaminate removal efficiency of the composite at a high level.

Regarding claim 14, Zhang et al disclose thermal regeneration (e.g., with hot water or stem, see line 6 of col. 12).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brym in view of Zhang et al as applied to claim 4 above, and further in view of Burns et al.

Zhang et al disclose silica gel but fails to specify xerogel. Burns et al disclose xerogel and suggest that such an adsorbent has a high surface area. It would have been obvious to have modified the silica gel substrate suggested by Brym and Zang et al so as to have included a silica xerogel as suggested by Burns et al in order to further increase the surface area of the substrate thereby increasing the reactive surface area of the composite.

Applicant's arguments filed 12-12-08 have been fully considered but they are not persuasive.

Applicant argues that Zhang et al fails to disclose catalyst particles dispersed in the substrate, however, it is held that Zhang et al disclose a process that produces TiO_2 photocatalyst particles dispersed in a silica gel substrate (see from lines 32-51 of col. 10).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

/Matthew O Savage/
Primary Examiner, Art Unit 1797
571-272-1146